

# Table of Contents

## Preface

## Chapter 1: Biomass Processing

<b>Assessment of Selected Industrial Byproducts as Alternative Nutrient Source for <i>E. Coli</i> pET30a-HIV-RT</b> L.S.P. Bacal, R.C.R. Suplito, E.A.B. Macauyag, A.E. Gambe-Gilbuena and R.G. Abisado-Duque	3
<b>Combined Effects of Solid-to-Liquid Ratio and Ethanol Concentration on the Organosolv Delignification of Extractives-Free Bagasse</b> I.D.F. Tabañag, C.F.L. Go, N.S.L. Uy, L.C.C. Uy and L.K. Cabatingan	13
<b>The Effects of Acid Concentration, Temperature, and Time on the Acid Hydrolysis of Mango (<i>Mangifera Indica</i>) Seed Husk to Produce 5-HMF</b> I.D.F. Tabañag, J. Cruda, K.A.S. Lu and R.M.B. Sapa	31

## Chapter 2: Energy Storage, Batteries, and Power Systems

<b>Mini Review: Implementing Gas Sensors in Battery Management Systems for Determining Battery Lifespan</b> M.R.A. Putra, M. Nizam and C.H.B. Apribowo	59
<b>The Impact of Tropical Conditions on Battery Pack Conditioning and Storage: A Mini Review</b> M.R.A. Putra, M. Nizam and W. Warindi	71
<b>Design and Simulation of Powerwall Casing for Energy Storage</b> R.O. Muhammad, D.R. Chrisnanda, R.S. Valeha, H.K.K. Aliwarga, A. Purwanto, H.I. Akbar and W.G. Suci	83
<b>Design and Implementation of Energy Management System for Hybrid Solar System</b> B.D. Jati, S. Al Farisi, F.H. Ma'ruf, F.S. Adinata, R.S. Valeha, A. Purwanto, H.K.K. Aliwarga and W.G. Suci	93

## Chapter 3: Thermal Engineering and Fluid Mechanics

<b>Air Entrainment by Infrared Suppressors: A Brief Review on Current Practices</b> R.C. Mishra, R.K. Mallik and A.K. Kumar Barik	107
<b>Effect of the Size of Mixing Tube on Air Ingression by an Infrared Suppression (IRS) Device</b> R.C. Mishra, R.K. Mallik and A.K. Barik	115

## Chapter 4: Equipment Design

<b>Design and Construction of Pneumatic System Simulation Tool as a Learning Media for Industrial Machine Repair</b> H. Santoso, A. Supriyatna, M. Jaya, S. Ardiani, V.R. Al Aziz and H.F. Alhakim	125
<b>Preparing a Heater Prototype for Self-Heating Food Packaging</b> S. Supardianningsih, S. Susiani, A. Jasmine and M. Nugraha	133

## Chapter 5: Mechatronics

<b>Prediction of Seat-Off towards Assistance for Sit-to-Stand Movement by RBFN</b> B. Behera, P. Baraskar and M.F. Orlando	141
<b>Design of Metal and Non-Metal Detector Based on Arduino Controller</b> A. Satyahadi, S. Ardiani, A. Dwi Firmanto and W. Sriyanto	153